Supplementary material S1. Table 1. GIS variables and the sources these have been extracted from.

variable	Name dataset	Units	Currency	Resolution	Reference system	Data source
Nitrogen surplus	N-surplus for agricultural soils and forests / rough grazing	kgN/km$^{2/}$yr	2002	1 km grids	ETRS 1989 LAEA	ftp://mars.jrc.ec.europa.eu/Afoludata/Public/DS237
Livestock density	Livestock density - livestock units per ha by NUTS 2 , 2007	LSU/ha	2007	NUTS2*	n.a.	http://epp.eurostat.ec.europa.eu/statistics_explained/images/3/39/Agriculture_and_environment_2011.xls http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&pcode=tgs00045&language=en
Population density	GEOSTAT population density grid 2006 per km2	persons/km2	2006 (LAU data)	1000 meter	ETRS 1989 LAEA	http://epp.eurostat.ec.europa.eu/portal/page/portal/gisco_Geographical_information_maps/popups/refere
GDP	GDP 2011 Eurostat in PPS on NUTS 3 level (% of EU28 average)	% of EU-28 average, EU-28 = 100	2011	NUTS3	n.a.	http://epp.eurostat.ec.europa.eu/statistics_explained/images/3/3c/Economy_RYB2014.xlsx
Impervious area	EEA Fast Track Service Precursor on Land Monitoring - Degree of soil sealing	% sealing/ha	2006	100 x 100 m grids	EPSG:3035	http://www.eea.europa.eu/data-and-maps/data/eea-fast-track-service-precursor-on-land-monitoring-degr
Discharge points	Waterbase - UWWTD: Urban Waste Water	n.a. (discharge points)	2007 - 2011	n.a. (point scale)	Geographic, WGS84	http://www.eea.europa.eu/data-and-maps/data/waterbase-uwwtd-urban-waste-water-treatment-directive-

	Treatment Directive					

Supplementary Material S1 table 2. Geographic catchment and reach corridor data used in the multivariate analysis.

label	explanation	Source
catchment		
lengthrestoredkm	length of the restored reach that was used in the assessment of ecosystem services. It is possible that these are only part of a larger restoration project, fx in Skjernå, Becva and Regge	Muhar et al. (in prep)
typeofrestoration	this is a brief text used to turn a qualitative impression of the intensity and extent of the restoration project into a simple number, which follows in the next column	Own assessment
typeofrestorationnumber	code 1, 2,3 in increasing severity	Own assessment
domesticsewageeffluents	the number of waste water discharge points into the river in the catchment upstream	GIS See S1 table 1
PPS2011	a purchasing parity gdp per capita used to estimate the percentage in the next variable	GIS see S1 table 1
gdppercentageeu	percentage gdp per capita of grand overall mean EU28	GIS see S1 table 1
Soilsealing, mn	GIS impervious area, mean	GIS see S1 table 1
Soilsealing, std	similar standard deviation	GIS see S1 table 1
popD, mn	GIS human population density	GIS see S1 table 1
PopD, std	similar standard deviation	GIS see S1 table 1
PopT	GIS total population in a catchment upstream of the study reach	GIS see S1 table 1
area	catchment area used for each study reach	GIS see S1 table 1
Nsurpfor, mn	GIS nitrogen surplus in forested parts of catchment, mean	GIS see S1 table 1
Nsurpfor, 2std	similar standard deviation	GIS see S1 table 1
Nusurpagr, mn	GIS nitrogen surplus in agricultural parts of catchment	GIS see S1 table 1
Nsurpagr, std	similar standard deviation	GIS see S1 table 1
livestock07sumheads	GIS total number of cattle heads	GIS see S1 table 1
livestock07dens	GIS cattle density	GIS see S1 table 1
rivslopemkm	GIS, slope in m/km estimated along the line of the main stream with linear regression, points every 100 m for a varable length of river upstream of the study reach	GIS, own analysis
rivsloper2	GIS, r2 of the linear fit of the regression of height against position for the slope	GIS, own analysis
meanQ	mean annual discharge of each river at or near the studied reach, as reported in the local assessment report	From Muhar et al., in prep, and study site reports
Reach corridor land use		All from GIS analyses, see references in Table 1
Percbuiltup	CORINE 111, 112, 121, 122, 131, 141, 142	
Percarable	CORINE 211	
percgrass	CORINE 231	
Complexagric	CORINE 242 and 243	

percwood	CORINE 312, 313, 324, 333
percmarsh	CORINE 411 and 412
percwater	CORINE 511 and 512

Supplementary material S2. Comparison of the value of ecosystem services of individual pairs of restored-unrestored river reaches. The most important components of each service are mentioned in the legend for each pair, and the primary is indicated with an *. Regulating services exclude flood risk reduction in the Narew because it could not be evaluated. Regulating services are expressed as net values and can be negative where current flood risk is a negative benefit as in the unrestored Drau. In the restored Regge flood risk reduction amounted to 1000 € ha^{-1} y^{-1}; in the Vääräjoki, flood risk reduction was -1 for the unrestored and – 2 € ha^{-1} y^{-1} for the restored reach (an increase in flood risk); In the restore Skjernå, flood risk reduction was 3 € ha^{-1} y^{-1}; in the unrestored Enns flooding was valued at -220 and in the restored Enns this was -150 € ha^{-1} y^{-1}; in the unrestored Drau flooding was valued at -45 € ha^{-1} y^{-1}; in the unrestored Becva flooding costs were estimated at -1900 whereas the restored reach had a benefit of +1800 € ha^{-1} y^{-1}; in the Morrumsån, finally, restoration did not affect flooding.